

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A system for sending low rate data on a packet basis in an 8-VSB standard data packet stream, said system comprising:

an 8-VSB signal transmitter capable of transmitting a low rate data packet that comprises data bytes, each of one or more of the data bytes containing both information bearing bits and non-information bearing bits,

wherein said low rate data packet comprises data bytes in which half of the bits in each data byte contain information and half of the bits in each data byte do not contain information,

and wherein said low rate data packet comprises eight (8) bit data bytes in which bit 6, bit 4, bit 2, and bit 0 in each data byte contain information and in which bit 7, bit 5, bit 3, and bit 1 in each data byte do not contain information.

2. (Currently Amended) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 1, wherein said 8-VSB signal transmitter is capable of determining values of said non-information bearing bits in said low rate data packet so that said non-information bearing bits will be correctly encoded.

3. (Cancelled).

4. (Currently Amended) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim ~~3-1~~, wherein said 8-VSB signal transmitter is capable of determining values of said bits that do not contain information so that said bits that do not contain information will be correctly encoded.

5. (Cancelled).

6. (Currently Amended) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim ~~5-1~~, wherein said 8-VSB signal transmitter is capable of determining values of bit 7, bit 5, bit 3, and bit 1 so that they will be correctly encoded.

7. (Currently Amended) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim ~~6~~, wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 so that each output symbol is from one of the four levels -7, -3, +3, and +7 by setting a value of a Z_2 bit from a trellis encoder of said 8-VSB signal transmitter equal to a value of a Z_0 bit from said trellis encoder.

8. (Currently Amended) The system for sending low rate data on a packet basis in an 8-VSB standard data packet stream as claimed

in Claim 7₁ wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 by calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator \oplus signifies a logical exclusive OR operation.

9. (Currently Amended) A system for sending ~~half-half-rate~~ data on a packet basis in an 8-VSB standard data packet stream in an 8-VSB signal transmitter of the type comprising a Reed Solomon encoder, a data interleaver, and a trellis encoder, wherein said system comprises:

a first data packet switch before said Reed Solomon encoder capable of determining whether a data packet is a ~~full~~ full-rate data packet or a ~~half-half-rate~~ data packet, said first data packet switch capable of sending a ~~full~~ full-rate data packet to said Reed Solomon decoder encoder and capable of sending a ~~half~~ half-rate data packet to said data interleaver; and

a second data packet switch after said trellis encoder capable of determining whether a data packet is a ~~full~~ full-rate

data packet or a ~~half-half-rate~~ data packet, said second data packet switch capable of sending a ~~full-full-rate~~ data packet to a multiplexer and capable of sending a ~~half-half-rate~~ data packet to an exclusive OR unit,

wherein said exclusive OR unit is capable of determining values of bits in a half-rate data packet that do not contain information so that said bits that do not contain information will be correctly encoded,

wherein said half rate data packet comprises eight (8) bit data bytes in which bit 6, bit 4, bit 2, and bit 0 in each data byte contain information and in which bit 7, bit 5, bit 3, and bit 1 in each data byte do not contain information;

and wherein said exclusive OR unit is capable of determining the values of bit 7, bit 5, bit 3, and bit 1 so that each output symbol is from one of the four levels -7, -3, +3, and +7 by setting a value of a Z_2 bit from said trellis encoder equal to a value of a Z_0 bit from said trellis encoder.

10-11. (Cancelled).

12. (Currently Amended) The system for sending ~~half-half-rate~~ data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim ~~11-9~~, wherein said exclusive OR unit is capable of determining the values of bit 7, bit 5, bit 3, and bit 1 by calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator \oplus signifies a logical exclusive OR operation.

13. (Currently Amended) The system for sending ~~half-half-rate~~ data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 12, wherein an output of said exclusive OR unit is coupled to an input of said Reed Solomon encoder; and wherein said exclusive OR unit is capable of sending a ~~half-half-rate~~ data packet to said Reed Solomon encoder in which the values of bit 7, bit 5, bit 3, and bit 1 in each data byte of said ~~half-half-rate~~ data packet have been determined so that all eight (8) bits in each data byte of said ~~half-half-rate~~ data packet will be correctly encoded.

14. (Currently Amended) The system for sending ~~half-half-rate~~ data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 13, wherein said system further comprisingcomprises:

a permutation unit located after said Reed Solomon encoder and before said data interleaver, said permutation unit capable of determining whether a data packet is a ~~full~~-full-rate data packet or a ~~half~~-half-rate data packet, said permutation unit capable of sending a ~~full~~-full-rate data packet to said data interleaver without performing a permutation, said permutation unit capable of permuting the bytes in a ~~half~~-half-rate data packet to ensure that parity byte positions do not occur before data byte positions in each data packet.

15. (Currently Amended) The system for sending ~~half~~-half-rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 14, wherein said permutation unit is capable of setting a rate bit in a field sync segment of said ~~half~~-half-rate data packet to change a status of said ~~half~~-half-rate data packet from ~~half~~-half-rate status to full rate status.

16. (Currently Amended) The system for sending ~~half~~-half-rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 15, wherein said system further comprising comprises an 8-VSB signal receiver comprising:

a reverse permutation unit located between a data de-interleaver and a Reed Solomon decoder, said reverse permutation unit capable of reversing the permutation of bytes carried out by said permutation unit of said 8-VSB signal transmitter.

17. (Currently Amended) A method for sending ~~low~~low-rate data on a packet basis in an 8-VSB standard data packet stream, said method comprising the steps of:

placing data in a ~~low~~low-rate data packet that comprises data bytes, each of one or more of the data bytes containing that contain both information bearing bits and non-information bearing bits;

determining values of said non-information bearing bits in said ~~low~~low-rate data packet so that said non-information bearing bits will be correctly encoded; and

transmitting said ~~low~~low-rate data packet with an 8-VSB signal transmitter,

wherein the step of placing data in a low-rate data packet that comprises data bytes that contain both information bearing bits and non-information bearing bits, comprises the steps of:

placing data in bit 6, bit 4, bit 2, and bit 0 in each eight (8) bit data byte so that bit 6, bit 4, bit 2, and bit 0 are information bearing bits; and

placing no data in bit 7, bit 5, bit 3, and bit 1 in each eight (8) bit data byte so that bit 7, bit 5, bit 3, and bit 1 are non-information bearing bits.

18. (Currently Amended) The method for sending ~~low~~low-rate data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 17, wherein said ~~low~~low-rate data packet comprises data bytes in which half of the bits in each data byte

contain information and half of the bits in each data byte do not contain information.

19. (Cancelled).

20. (Currently Amended) The method for sending ~~low-low-rate~~ data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim ~~19-17~~, wherein the step of determining the values of said non-information bearing bits in said ~~low-low-rate~~ data packet so that said non-information bearing bits will be correctly encoded, comprises the step of:

setting a value of a Z_2 bit from a trellis encoder of said 8-VSB signal transmitter equal to a value of a Z_0 bit from said trellis encoder so that each output symbol is from one of four levels -7, -3, +3, and +7; and calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator \oplus signifies a logical exclusive OR operation.

21. (Currently Amended) The method for sending ~~low-low-rate~~ data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim 20, wherein said method further comprising
comprises the steps of:

permuting the bytes in said ~~low-low-rate~~ data packet to ensure that parity byte positions of said ~~low-low-rate~~ data packet do not occur before data byte positions in each ~~low-low-rate~~ data packet; and

reverse permuting said permuted bytes in said ~~low-low-rate~~ data packet after said ~~low-low-rate~~ data packets are received in an 8-VSB signal receiver.

22. (Currently Amended) The method for sending ~~low-low-rate~~ data on a packet basis in an 8-VSB standard data packet stream as claimed in Claim ~~19-17~~, wherein said method further comprising
comprises the steps of:

sending said low rate data packet through a data interleaver;

sending said low rate data packet through a trellis encoder;

sending said low rate data packet through an exclusive OR unit;

sending said low rate data packet through a Reed Solomon encoder;

sending said low rate data packet through a permutation unit;

sending said low rate data packet through said data interleaver a second time; and

sending said low rate data packet through said trellis encoder a second time.

23. (Currently Amended) A high definition television system comprising a system for sending ~~low~~-low-rate data on a packet basis in an 8-VSB standard data packet stream, said system comprising:

an 8-VSB signal transmitter capable of transmitting a ~~low~~-low-rate data packet that comprises data bytes, each of one or more of the data bytes containing that contain both information bearing bits and non-information bearing bits,

wherein said low-rate data packet comprises eight (8) bit data bytes in which bit 6, bit 4, bit 2, and bit 0 in each data byte contain information and in which bit 7, bit 5, bit 3, and bit 1 in each data byte do not contain information,

and wherein said 8-VSB signal transmitter is capable of determining the values of bit 7, bit 5, bit 3, and bit 1 so that they will be correctly encoded.

24. (Currently Amended) The high definition television system as claimed in Claim 23, wherein said 8-VSB signal transmitter is capable of determining values of said non-information bearing bits in said ~~low~~-low-rate data packet so that said non-information bearing bits will be correctly encoded.

25. (Cancelled).

26. (Currently Amended) The high definition television system as claimed in Claim ~~25~~23, wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 so that each output symbol is from one of the four levels -7, -3, +3, and +7 by setting a value of a Z_2 bit from a trellis encoder of said 8-VSB signal transmitter equal to a value of a Z_0 bit from said trellis encoder.

27. (Currently Amended) The high definition television system as claimed in Claim 26, wherein said 8-VSB signal transmitter determines the values of bit 7, bit 5, bit 3, and bit 1 by calculating the values of bit 7, bit 5, bit 3, and bit 1 from an expression:

$$X_2(k) = Z_2(k) \oplus Z_2(k - 12)$$

where $X_2(k)$ represents the value of a bit before the bit is input to a pre-coder of said trellis encoder, and where Z_2 represents the value of a bit after the bit is output from said trellis encoder, and where k is a time index, and where the operator \oplus signifies a logical exclusive OR operation.

28. (Currently Amended) The high definition television system as claimed in Claim 27, wherein said high definition television system further comprisingcomprises:

a permutation unit located after a Reed Solomon encoder and before a data interleaver in said 8-VSB signal transmitter, said permutation unit capable of permuting the bytes in a half rate data packet to ensure that parity byte positions do not occur before data byte positions in each data packet.

29. (Currently Amended) The high definition television system as claimed in Claim 28, wherein said high definition television system further comprisingcomprises:

an 8-VSB signal receiver comprising a reverse permutation unit located between a data de-interleaver and a Reed Solomon decoder of said 8-VSB signal receiver, said reverse permutation unit capable of reversing the permutation of bytes carried out by said permutation unit of said 8-VSB signal transmitter.